

CLAIMS

I claim:

1. A gun-lock device for a firearm having a barrel with a generally cylindrical bore therein and a generally cylindrical chamber of diameter greater than that of the bore for receiving an ammunition cartridge in alignment with said bore, and said gun-lock device comprising:

a dummy cartridge chamber plug member with exterior dimensions similar to said ammunition cartridge for said firearm's chamber, wherein said chamber plug member having a hollow interior and having an open forward end of diameter less than that of said bore and that of the hollow interior;

a tube adapted to be inserted coaxially into the bore, the tube having a proximal end portion, a distal end portion, and a length sufficient to extend from the muzzle to the chamber, wherein the distal end portion of the tube extending into said hollow interior of the chamber plug member;

a distal subassembly on the distal end portion of the tube defining at least one barb member pivotally mounted and operated through a partial pivotal movement between a first position corresponding to the first configuration of the distal subassembly wherein the diameter to the tip of the barb member is greater than that of said open forward end of the chamber plug member so that the distal subassembly does not obstruct removal of the tube from the chamber plug member, and a second position corresponding to the second configuration of the distal subassembly wherein the diameter to the tip of the barb member is less than that of said open forward end of the chamber plug member so that the distal subassembly does not obstruct removal of the tube from the chamber plug member and the bore;

a lock subassembly on the proximal end of the tube for enabling a user to selectively move the distal subassembly between said first and second configurations while the correct key is inserted, the lock subassembly including a tumbler cylinder adapted to be rotated about the

longitudinal axis of the tube a partial turn between a first position of the tumbler cylinder corresponding to the distal subassembly being in said first configuration and a second position of the tumbler cylinder corresponding to the distal subassembly being in said second configuration, and the lock subassembly including means for locking the tumbler cylinder in the first position; and

an actuator subassembly disposed within the tube for converting the rotational movement from the tumbler cylinder of the lock subassembly to an axial movement of a rod member and transferring it to the distal subassembly, wherein the actuator subassembly including (i) a shaft disposed coaxially within the tube wherein the proximal end of the shaft is connected to said tumbler cylinder of the lock subassembly to couple rotational movement thereof, (ii) an adapter means connected at the distal end of said shaft to couple rotational movement thereof and, and (iii) said rod member disposed coaxially within the tube and so arranged to connect the motion between said adapter means and the distal subassembly;

2. A device in combination with a firearm as recited in claim 1, wherein:

said adapter means of the actuator subassembly defining an inclined surface feature therein for said rod member to cooperate and said rod member so arranged such that it is prevented from being rotated about the longitudinal axis of the tube, and that rotational movement of the adapter means causes the rod member to move axially along the longitudinal axis of the tube; and

said barb member of the distal subassembly including an inclined surface feature therein for the distal end portion of said rod member to cooperate, such that the axial movement of said rod member causes a pivotal movement of the barb member.

3. A device in combination with a firearm as recited in claim 2, wherein:

said rotational movement of the tumbler cylinder of the lock subassembly from said first position to said second position causes an axial movement of the rod member toward the

proximal end of the tube and the tumbler cylinder rotation from the second position to the first position causes an axial movement of the rod member away from the proximal end of the tube; and

said axial movement of the rod member toward the proximal end of the tube causes a pivotal movement of the barb member toward said second position of the barb member and axial movement of the rod member away from the proximal end of the tube causes a pivotal movement of the barb member toward said first position of the barb member.

4. A device in combination with a firearm as recited in claim 2, wherein said inclined surface feature within said adapter means does not obstruct the axial movement of said rod member toward the proximal end of the tube irrespective of the position of the tumbler cylinder of the lock subassembly to the extent that said barb member may be allowed to be moved from said first configuration of the distal subassembly to the said second configuration upon contacting with said open forward end during a relative movement of the distal subassembly inward of the chamber plug member.

5. A device in combination with a firearm as recited in claim 1, wherein said distal subassembly including a compression spring so arranged that it creates force to bias said barb member toward said first configuration of the distal subassembly.

6. A device in combination with a firearm as recited in claim 1, including a spring-loaded plunger arrangement at the distal end portion of said tube and so adapted to fit within said hollow interior of the chamber plug member, wherein the length to the tip of the plunger arrangement at its natural state is greater than the corresponding depth dimension allowed by said hollow interior in the chamber plug member, such that while the distal portion of the tube is extended into the hollow interior of the chamber plug member and the distal subassembly maintained at said first configuration, the plunger arrangement is maintained compressed, and when the distal subassembly is moved into said second configuration the energy stored in the spring-loaded plunger arrangement is unleashed to push the tube apart from the bottom of said hollow interior of the chamber plug member.

7. A device in combination with a firearm as recited in claim 1, including a torsional spring disposed within the tube and so arranged such that it creates torque to bias said tumbler cylinder toward said first position.
8. A device in combination with a firearm as recited in claim 1, wherein said barb member at the distal portion of the tube consists of two barb members, symmetrically disposed about the longitudinal axis of the tube to operate in opposing directions from each other.
9. A device in combination with a firearm as recited in claim 1, wherein said key comprises a key element including all of the features required for proper operation according to the invention and so arranged to allow it to be mounted onto various substrate bodies for ease of handling, wherein various substrate bodies including a ring which may be worn on a finger of the user.
10. A device in combination with a firearm as recited in claim 1, wherein a means for locking said tumbler cylinder in the first position including:

a lock body connected to the proximal end of the tube having a first recess coaxial with the tube, wherein it is open toward the proximal end of the lock body and is closed toward the distal end with a flat bottom face which is perpendicular to the longitudinal axis of the tube, and a plurality of recesses disposed in a circular formation about the longitudinal axis of the first recess, wherein the plurality of recesses starting from said flat bottom face and extending toward the distal end of the lock body with their longitudinal axes parallel to that of the first recess;

said tumbler cylinder so adapted to be received into said first recess of the lock body and having a flat distal surface, so arranged to abut said flat bottom face in the lock body, and a plurality of recesses disposed in a circular formation about the longitudinal axis of the tumbler cylinder, wherein the plurality of recesses starting from said distal flat surface and extending toward the proximal end of the tumbler cylinder with their longitudinal axes parallel to that of

the tube, and the tumbler cylinder so arranged that when it is at said first position, the plurality of recesses therein are in alignment with said plurality of recesses in the lock body;

a plurality of a pairs of cylindrical members consisting of first members and second members, wherein the first members are of varying lengths along the longitudinal axes thereof and each of the first members are axially disposed within each of said plurality of recesses in the tumbler cylinder and each of the second members are axially disposed within each of said plurality of recesses in the lock body; and

a spring at the distal end of each of said second members within each of the plurality of recesses in the lock body.

11. A device in combination with a firearm as recited in claim 10, wherein:

said pairs of cylindrical members and said plurality of recesses in the tumbler cylinder are arranged in such physical proportions that while the tumbler cylinder is at said first position, each of the pairs of cylindrical members are preloaded by each of said springs toward the proximal end within each of the plurality of recesses in the tumbler cylinder and result in the proximal portions of each of said second members of the pairs of cylindrical members being received partially into each of the plurality of recesses in the tumbler cylinder while the remaining portions of the second members remain within the plurality of recesses in the lock body, thus, the second members obstruct the tumbler cylinder rotation; and

said first members of said varying lengths of the pairs of cylindrical members are individually so assigned to each of said plurality of recesses in the tumbler cylinder, such that when a correct key is inserted into the tumbler cylinder, each of the pairs of the cylindrical members are displaced toward the distal end of the plurality of recesses in the lock body by a precise amount, such that the entire portion of each of said first members remain within each of the plurality of recess in the tumbler cylinder and the entire portion of each of said second members remain within each of the plurality of recesses in the lock body, thus, none of the first members nor second members obstruct the tumbler cylinder rotation.

12. A device in combination with a firearm as recited in claim 10, wherein said plurality of pairs of cylindrical members consist of four pairs, and said varying lengths of the first members are five lengths in equally divisible increments.

13. A device in combination with a firearm as recited in claim 11, wherein said tumbler cylinder further including a frontal face fully unobstructed toward the proximal end of the tube and a plurality of apertures of the same quantity as, and of diameter less than, that of said plurality of recesses within the tumbler cylinder, wherein each of the apertures are coaxially aligned with each of the plurality of recesses in the tumbler cylinder and connecting between said frontal face and the bottom depth of each of the plurality of recesses in the tumbler cylinder.

14. A device in combination with a firearm as recited in claim 13, wherein said key comprises a base surface and plurality of fingers projecting from the same, wherein the quantity of said fingers is at least that of said plurality of apertures and the individual length and placement of each of the fingers are so defined that when the key is correctly inserted and that said base surface of the key abuts said frontal face of the tumbler cylinder, each of said pairs of cylindrical members are displaced by the corresponding finger by the exact amount required to allow the tumbler cylinder rotation as said.

15. A gun-lock device for a firearm having a barrel with a generally cylindrical bore therein and a generally cylindrical chamber of diameter greater than that of the bore for receiving an ammunition cartridge in alignment with said bore, said gun-lock device comprising:

a dummy cartridge chamber plug member with exterior dimensions similar to said ammunition cartridge for said firearm's chamber, wherein said chamber plug member having a hollow interior and having an open forward end of diameter less than that of said bore and that of the hollow interior;

a tube adapted to be inserted coaxially into the bore, the tube having a proximal end portion, a distal end portion, and a length sufficient to extend from the muzzle to the chamber, wherein the distal end portion of the tube extending into said hollow interior of the chamber plug member;

a distal subassembly on the distal end portion of the tube that is adapted to be moved under user control between a first configuration of the distal subassembly that does not fit said open forward end of said chamber plug member so that the distal subassembly does not obstruct removal of the tube from the chamber plug member, and a second configuration of the distal subassembly that does fit said open forward end so that the distal subassembly does not obstruct removal of the tube from the chamber plug member and the bore;

a lock subassembly on the proximal end of the tube for enabling a user to selectively move the distal subassembly between said first and second configurations while the correct key is inserted, the lock subassembly including a tumbler cylinder adapted to be rotated about the longitudinal axis of the tube a partial turn between a first position of the tumbler cylinder corresponding to the distal subassembly being in said first configuration and a second position of the tumbler cylinder corresponding to the distal subassembly being in said second configuration, and the lock subassembly including means for locking the tumbler cylinder in the first position;

an actuator subassembly disposed within the tube for converting the rotational movement from the tumbler cylinder of the lock subassembly to an axial movement of a rod member and transferring it to the distal subassembly, wherein the actuator subassembly including (i) a shaft disposed coaxially within the tube wherein the proximal end of the shaft is connected to said tumbler cylinder of the lock subassembly to couple rotational movement thereof, (ii) an adapter means connected at the distal end of said shaft to couple rotational movement thereof, and (iii) said rod member disposed coaxially within the tube and so arranged to connect the motion between the adapter means and the distal subassembly; and

a means for locking said tumbler cylinder in the first position including (i) a lock body connected to the proximal end of the tube and having a first recess coaxial with the tube, wherein the first recess is open toward the proximal end of the lock body and is closed toward the distal end of the lock body with a flat bottom face which is perpendicular to the longitudinal axis of the first recess, and a plurality of recesses disposed in a circular formation about the longitudinal axis of the first recess, wherein each of the plurality of recesses starting from said flat bottom face and extending toward the distal end of the lock body with their longitudinal axes parallel to that of said first recess; (ii) said tumbler cylinder coaxially received into said first recess of the lock body and having a flat distal surface, so arranged to abut said flat bottom face of the lock body, and a plurality of recesses disposed in a circular formation about the longitudinal axis of the tumbler cylinder, wherein each of the plurality of recesses starting from said distal flat surface and extending toward the proximal end of the tumbler cylinder with their longitudinal axes parallel to that of the tumbler cylinder, and the tumbler cylinder so arranged that while it is at said first position, said plurality of recesses therein are in alignment with said plurality of recesses in the lock body; (iii) a plurality of pairs of cylindrical members consisting of first members and second members, wherein the first members are of varying lengths along the longitudinal axes thereof and each of the first members axially disposed within each of said plurality of recesses in the tumbler cylinder and each of the second members axially disposed within each of said plurality of recesses in the lock body; and (iv) a spring at the distal end of each of the second members within each of said plurality of recesses in the lock body.

16. A device in combination with a firearm as recited in claim 15, wherein:

said pairs of cylindrical members and said plurality of recesses in the tumbler cylinder are arranged in such physical proportions that while the tumbler cylinder is at said first position, each of the pairs of cylindrical members are preloaded by each of said springs toward the proximal end within each of the plurality of recesses in the tumbler cylinder and result in the proximal portions of each of said second members of the pairs of cylindrical members being received partially into each of the plurality of recesses in the tumbler cylinder while the

remaining portions of the second members remain within the plurality of recesses in the lock body, thus, the second members obstruct the tumbler cylinder rotation; and

said first members of said varying lengths of the pairs of cylindrical members are individually so assigned to each of said plurality of recesses in the tumbler cylinder, such that when a correct key is inserted into the tumbler cylinder, each of the pairs of the cylindrical members are displaced toward the distal end of the plurality of recesses in the lock body by a precise amount, such that the entire portion of each of said first members remain within each of the plurality of recess in the tumbler cylinder and the entire portion of each of said second members remain within each of the plurality of recesses in the lock body, thus, none of the first members nor second members obstruct the tumbler cylinder rotation.

17. A device in combination with a firearm as recited in claim 15, wherein said plurality of pairs of cylindrical members consist of four pairs and said varying lengths of the first members are five lengths in equally divisible increments.

18. A device in combination with a firearm as recited in claim 15, wherein said adapter means of the actuator subassembly defining an inclined surface feature therein for said rod member to cooperate and said rod member so arranged such that it is prevented from being rotated about the longitudinal axis of the tube, and that rotational movement of the adapter means causes the rod member to move axially along the longitudinal axis of the tube.

19. A device in combination with a firearm as recited in claim 15, wherein said rotational movement of the tumbler cylinder of the lock subassembly from said first position to the second position causes an axial movement of the rod member toward the proximal end of the tube and the tumbler cylinder rotation from the second position to the first position causes an axial movement of the rod member away from the proximal end of the tube.

20. A device in combination with a firearm as recited in claim 18, wherein said inclined surface feature within said adapter means does not obstruct the axial movement of said rod member toward the proximal end of the tube irrespective of the position of the tumbler cylinder

of the lock subassembly to the extent that said distal subassembly be allowed to be moved from said first configuration of the distal subassembly to said second configuration upon contacting with said open forward end during a relative movement of the distal subassembly inward of the chamber plug member.

21. A device in combination with a firearm as recited in claim 15, including a spring-loaded plunger arrangement at the distal end portion of said tube and so adapted to fit within said hollow interior of the chamber plug member, wherein the length to the tip of the plunger arrangement at its natural state is greater than the corresponding depth dimension allowed by said hollow interior of the chamber plug member, such that while the distal portion of the tube is extended into the hollow interior of the chamber plug member and the distal subassembly maintained at said first configuration, the plunger arrangement is maintained compressed, and when the distal subassembly is moved into said second configuration the energy stored in the spring-loaded plunger arrangement is unleashed to push the plunger apart from the bottom of said hollow interior of the chamber plug member.
22. A device in combination with a firearm as recited in claim 15, including a torsional spring disposed within the tube and so arranged such that it creates torque to bias said tumbler cylinder toward said first position.
23. A device in combination with a firearm as recited in claim 15, wherein said distal subassembly including a spring so arranged that it creates force to bias the distal subassembly into said first configuration.
24. A device in combination with a firearm as recited in claim 16, wherein said tumbler cylinder further including a frontal face fully unobstructed toward the proximal end of the tube and a plurality of apertures of the same quantity as and of diameter less than that of said plurality of recesses in the tumbler cylinder, wherein each of the apertures are coaxially aligned with each of the plurality of recesses in the tumbler cylinder and connecting between said frontal face and the bottom depth of each of the plurality of recesses in the tumbler cylinder.

25. A device in combination with a firearm as recited in claim 24, wherein said key comprises a base surface and plurality of fingers projecting from the same, wherein the quantity of said fingers is at least that of said plurality of apertures and the individual length and placement of each of the fingers are so defined that when the key is correctly inserted and that said base surface of the key abuts said frontal face of the tumbler cylinder, each of said pairs of cylindrical members are displaced by the corresponding finger by the exact amount required to allow the tumbler cylinder rotation as said.

26. A device in combination with a firearm as recited in claim 15, wherein said key comprises a key element including all of the features required for proper operation according to the invention and so arranged to allow it to be mounted onto various substrate bodies for ease of handling, wherein various substrate bodies including a ring which may be worn on a finger of the user.

27. A lock device in combination with a key comprising:

a lock body having a first end, a second end, a first recess coaxially within the lock body wherein said first recess is unobstructed toward said first end and is closed toward said second end, a flat bottom face at said closed end perpendicular to the longitudinal axis of the first recess, and a plurality of recesses disposed in a circular formation about the longitudinal axis of the first recess starting from said flat bottom face and extending toward said second end with the longitudinal axes of the plurality of recesses parallel to that of the first recess;

a tumbler cylinder adapted to be received within said first recess of the lock body and rotated about the longitudinal axis of said first recess of the lock body while the correct key is inserted and having a flat distal surface so arranged to abut said flat bottom face of the lock body, a front face on the end opposite of the flat distal surface, and a plurality of recesses disposed in a circular formation about the longitudinal axis of the tumbler cylinder, wherein the plurality of recesses starting from said distal flat surface and extending toward said front face with their longitudinal axes parallel to that of the tumbler cylinder, and the tumbler cylinder defining a

first position wherein said plurality of recesses in the tumbler cylinder are in alignment with said plurality of recesses in the lock body;

a plurality of a pairs of cylindrical members consisting of first members and second members, wherein the first members are of varying lengths and each of the first members are axially disposed within each of said plurality of recesses in the tumbler cylinder and each of the second members are axially disposed within each of said plurality of recesses in the lock body;

a spring behind each of said second members within each of the plurality of recesses in the lock body; and

a key element including all of the features required for proper operation according to the invention and so arranged to allow it to be mounted onto various substrate bodies for ease of handling, wherein various substrate bodies including a ring which may be worn on a finger of the user.

28. A lock device in combination with a key as recited in claim 27, wherein:

said pairs of cylindrical members and said plurality of recesses in the tumbler cylinder are arranged in such physical proportions that while the tumbler cylinder is at said first position, each of the pairs of the cylindrical members are preloaded by each of said springs toward said first end of the lock body within each of the plurality of recesses in the tumbler cylinder and result in each of said second members of the pairs of cylindrical members being partially received into each of the plurality of recesses in the tumbler cylinder while the remaining portions of the second members remain within the plurality of recesses in the lock body, thus, the second members obstruct the tumbler cylinder rotation; and

said first members of said varying lengths of the pairs of cylindrical members are individually so assigned to each of said plurality of recesses in the tumbler cylinder, such that when a correct key is inserted into the tumbler cylinder each of the pairs of the cylindrical members are displaced toward said second end of the lock body within the plurality of recesses in the lock

body by a precise amount, such that the entire portion of each of said first members remain within each of the plurality of recesses in the tumbler cylinder and the entire portion of each of said second members remain within each of the plurality of recesses in the lock body, thus, none of the first members nor second members obstruct the tumbler cylinder rotation.

29. A lock device in combination with a key as recited in claim 27, wherein said plurality of pairs of cylindrical members consist of four pairs and said varying lengths of the first members are five lengths in equally divisible increments.

30. A lock device in combination with a key as recited in claim 28, wherein said front face of the tumbler cylinder is unobstructed and said tumbler cylinder further including a plurality of apertures of the same quantity as and of diameter less than that of said plurality of recesses within the tumbler cylinder, wherein each of the apertures are coaxially aligned with each of the plurality of recesses in the tumbler cylinder and connecting between said front face and the bottom depth of each of the plurality of recesses in the tumbler cylinder.

31. A lock device in combination with a key as recited in claim 30, wherein said key comprises a base surface and a plurality of fingers projecting from the same, wherein the quantity of said fingers is at least that of said plurality of apertures and the individual length and placement of each of the fingers are so defined that when the key is correctly inserted and that said base surface of the key abuts said front face of the tumbler cylinder, each of said pairs of cylindrical members are displaced by the corresponding finger by the exact amount required to allow the tumbler cylinder rotation as said.